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ABSTRACT

The computer program MARKTF-M6, written in FORTRAN IV, sccres tests (consisting of true-or-false statements about concepts or facts) by comparing the list cf true or false values prepared by the instructor with those from the students. The output consists of information to the superviscr about th performance of the students, primarily for his records only, but one page of the output is suitable for posting. This program is similar to MARKTF-M5, but imposes some constraints on control of the scoring by the performance of the students. The program method, format of the data deck, notes on general procedure, and the FORTRAN IV program are discussed briefly. A listing on an IBM 407 of the main program and subroutine, along with a typical set of data, a listing of the package binary decks with a typical set of data, and typical output of the program are provided. (For related documents, see TM 002 778, 789-792.) (Author/DB)

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CANADA

Information on computer programs of the PEDAGE system, for use in scoring and analyzing methods of teaching and examining knowledge of factual material.

MARKTF-M6-F4

December 10, 1965

University of Toronto
Department of Geology

Computer Program MARKTF-M6

Written in FORTRAN IV source language

For IBJOB compiler, IBSYS monitor, IBM 7094-II computer.

Conforms to current conventions of the Institute of Computer Science, University of Toronto.

Purpose. This program scores tests (consisting of true-or-false statements about concepts or facts) by comparing the list of true or false values prepared by the instructor with those from the students. The output consists of information to the supervisor about the performance of the students, primarily for his records only, but one page of the output is suitable for posting. This program is similar to MARKTF-M5 but imposes some constraints on control of the scoring by the performance of the students.

Method. The program makes a regression analysis of correctness of all answers (relative to the examiner's control data) and the individual net scores on the test, for each examination statement in turn. The regression slopes for all statements are used as weighting factors in redetermining individual scores, which in turn are used to compute revised regression slopes. This is iterated four times. Within each cycle of iteration, slopes greater than 1.0 are set to 1.0, and any negative slopes are set to zero. Also, resultant scores are incremented or decremented to bring the mean to a value stated in the data deck, and any scores below zero or above one hundred are made zero or one hundred, respectively.

The final regression slopes for each statement are output, also the final centroid values, and the statement numbers of zero slopes are listed. The average regression slope is output as a percentage of the ideal value (1.0), and this is a measure of idealness of the set of statements for examination of the class.

The user has the option of combining prior scores from other tests with either 1) the raw scores obtained by using unit weights on each statement or 2) the scores weighted by regression slope factors, to give a current score. Summarizing, he can use this program to obtain information on the efficiency of each examination

statement, to score the students according to his control data and according to the performance of the whole class, and has an option as to which scores are to be combined with prior scores to give current scores.

<u>Data</u>. The format of the data deck is based on the use of 81-place mark-sense cards (FGS system, IBM electrotype 78326), but otherwise it is quite simple.

Using examples, the data deck is made up as follows:

1st card:

```
$DATA
```

2nd card, format (3I6)

```
▪▪▪▪54▪▪▪▪46▪▪▪▪▪2
```

54 is the number of statements, which may be up to 81; 46 is the number of students, which may be up to 200; 2 is the option selected for combining scores on this test with prior current scores and may be 1 or 2)

3rd card, format (27A1, 6A6, F5.2, F4.1)

```
U▪Y'U840800Y(UYY84088UYY''8TEST 4,GEOL 116,CHAP.7 AND REVIEW   4.0  60.0
```

(The first 27 characters are the symbols resulting from compressing the 27 columns of triple-row mark-sense data to the left; the next 36 columns contain the title of the test; the next 5 columns contain the number of the test (in real decimal point form) and the next 4 columns contain the desired mean of the scores when the weighted values for each statement are used in computing the scores.)

4th and following cards, format (27A1,6A6,F5.2,F4.1)

```
U▪YYU44▪804Y(UY8(4084UYY"4STEPHENS,J.J., II SOC+PHIL,UC        62.6 5.0
```

(The first 27 columns contain MS data as above; the next 36 columns contain the name and other information of the student; the next 5 columns contain his previous score in the course; the last 4 columns contain any increment or decrement to be added to this test score before combining with the prior score to give a new current score.)

Notes on general procedure. The blank MS cards are punched with the names of the students(starting at column 28 and not extending past column 63) and duplicates are made for all tests of the year. One of these is marked by each student at each examination, and then the supervisor punches in the current prior score into columns 64 to 68 inclusive, and any increment or decrement into columns 69 to 72 inclusive. The MS cards (control card and students cards) are punched by the IBM 519 machine such that the 27 MS marks become punches in the first 27 columns of the card. This deck is duplicated on blank cards by the same machine and added to the data deck after the single control and option card and $DATA card. The data deck is put behind the program deck containing a proper identification first card and then is ready to run.

The MS cards ready for punching the MS data are put face down in the usual position in the PUNCH hopper, with the "Standard MS" control panel in the machine. At least one card should be checked after the run to verify that every pencil mark is represented by an equivalent punch in the same row. If the card with the lightest or thinnest pencil lines gives true punches, there is little chance that any of the others are mispunched. After punching, the MS cards are put in the READ hopper and a stack of blank cards are put in the PUNCH hopper, with the "80/80" control panel in the machine, and a duplicate deck is made. In this step, the MS deck and blank cards should be turned face up. This is to avoid the chance of misreading the punched information when rough cards (due to erasures) are present.

The FORTRAN IV Program

Users normally will obtain a copy of the compiled program in the form of column-binary punched cards but the FORTRAN programs would be required if changes are to be made. All of the arithmetical and statistical manipulations are done in the main program: the subroutine (called DECODE in the program and DECOMS in the binary deck) is only used for the decoding of the triple-row compressed MS coding of 27 columns into lists of 81 T or F characters. A listing on an IBM 407 machine of the two programs, along with a typical set of data, and a listing of the package of binary decks with a typical set of data, are shown below.

Typical output of the program is shown below. The first page contains a list of the names of the students (in the same order as presented in the data deck), and three columns of scores. The first is with unit weights on each statement of the test, the second is with weights on each statement computed from the performance of the students as a group, and the third is a combination of either one or the other of these scores with prior scores to form a current score. The second and third pages list the serial numbers of the statements, the T or F values assigned by the instructor, the computed weighting factors and the computed average values of correctness of the student's answers, assuming that the instructor's T/F values are correct. Miscellaneous further information is given on the third page. A dummy line of output forces the normal termination information to be printed on the fourth page.

The execution time on a 7094-II computer is about one second for each 50 students tested.

```
$IBFTC MTF6    DECK
C**PROGRAM MARKTF-M6-F4 **
C**A PART OF THE PEDAGE SYSTEM **
C**SCORES T/F TESTS, CORRECTING FOR VARIATION OF SCORING EFFICIENCY
C  OF EACH STATEMENT.
      DIMENSION TITLE(6), CODE(27),TAN(81),ANS(81),NAME(6,200),
     1 TESTAT(81,200),CORLO(81),CORHI(81),FAC(81),SCORES(200),
     2 CORAV(81),HOLD(200),NUM(81),CUMPC(200),BONUS(200),COMBIN(200)
      LOGICAL TAN,ANS,OK
      DATA ZERO,ONE,HUND/0.0,1.0,100.0/
      READ(5,12) NSTATS,NSTUDS,NOPT
      RNSTUD=NSTUDS
      RNSTAT=NSTATS
      READ(5,15) CODE,TITLE,XNUM,AVMARK
      WRITE(6,21) TITLE
      OK=.TRUE.
      CALL DECODE(CODE,TAN,OK)
      IF(.NOT.OK) GO TO 1000
      AVER=ZERO
      DO 200 N=1,NSTUDS
      OK=.TRUE.
      READ(5,15) CODE,(NAME(L,N),L=1,6),CUMPC(N),BONUS(N)
      CALL DECODE(CODE,ANS,OK)
      IF(.NOT.OK) WRITE(6,30) (NAME(L,N),L=1,6)
      SCORE=ZERO
      DO 160 K=1,NSTATS
      IF((TAN(K).AND.ANS(K)).OR.(.NOT.TAN(K).AND..NOT.ANS(K))) GO TO 130
      SCORE=SCORE-ONE
      TESTAT(K,N)=-ONE
      GO TO 160
  130 SCORE=SCORE+ONE
      TESTAT(K,N)=ONE
  160 CONTINUE
      SCORE=SCORE*HUND/RNSTAT
      AVER=AVER+SCORE
      SCORES(N)=SCORE
      HOLD(N)=SCORE
  200 CONTINUE
      AVER=AVER/RNSTUD
      RAWAV=AVER
      DIF=AVMARK-AVER
      DO 202 N=1,NSTUDS
      SCORES(N)=SCORES(N)+DIF
  202 CONTINUE
      DO 400 IIER=1,4
      AVLO=ZERO
      AVHI=ZERO
      RNLO=ZERO
      RNHI=ZERO
      DO 205 K=1,NSTATS
      CORLO(K)=ZERO
      CORHI(K)=ZERO
  205 CONTINUE
      DO 250 N=1,NSTUDS
      IF(SCORES(N)-AVMARK) 210,210,230
  210 RNLO=RNLO+ONE
      AVLO=AVLO+SCORES(N)
      DO 220 K=1,NSTATS
      CORLO(K)=CORLO(K)+TESTAT(K,N)
  220 CONTINUE
      GO TO 250
```

```
  230 RNHI=RNHI+ONE
      AVHI=AVHI+SCORES(N)
      DO 240 K=1,NSTATS
      CORHI(K)=CORHI(K)+TESTAT(K,N)
  240 CONTINUE
  250 CONTINUE
      AVLO=AVLO/RNLO
      AVHI=AVHI/RNHI
      DIF=AVHI-AVLO
      SUMWT=ZERO
      DO 260 K=1,NSTATS
      CORAV(K)=(CORLO(K)+CORHI(K))/RNSTUD
      CORLO(K)=CORLO(K)/RNLO
      CORHI(K)=CORHI(K)/RNHI
      FACTOR=HUND/DIF*(CORHI(K)-CORLO(K))
      IF(FACTOR.LT.ZERO) FACTOR=ZERO
      IF(FACTOR.GT.ONE) FACTOR=ONE
      FAC(K)=FACTOR
C** FAC(K) IS THE SET OF WEIGHTING FACTORS FOR REVISING THE RAW SCORES**
      SUMWT=SUMWT+FAC(K)
C**SUMWT IS THE DIVISOR REQUIRED TO NORMALIZE THE SCORES RELATIVE TO 1.0
  260 CONTINUE
      AVER=ZERO
      DO 300 N=1,NSTUDS
      SCORE=ZERO
      DO 280 K=1,NSTATS
      SCORE=SCORE+TESTAT(K,N)*FAC(K)
  280 CONTINUE
      SCORE=SCORE*HUND/SUMWT
      AVER=AVER+SCORE
      SCORES(N)=SCORE
  300 CONTINUE
      AVER=AVER/RNSTUD
      DIF=AVMARK-AVER
      DO 350 N=1,NSTUDS
      SCORES(N)=SCORES(N)+DIF
  350 CONTINUE
  400 CONTINUE
      CURAV=ZERO
      DO 500 N=1,NSTUDS
      IF(SCORES(N).LT.ZERO) SCORES(N)=ZERO
      IF(SCORES(N).GT.HUND) SCORES(N)=HUND
      GO TO(410,420),NOPT
  410 COMBIN(N)=(HOLD(N)   +BONUS(N)+(XNUM-ONE)*CUMPC(N))/XNUM
      GO TO 425
  420 COMBIN(N)=(SCORES(N)+BONUS(N)+(XNUM-ONE)*CUMPC(N))/XNUM
  425 CURAV=CURAV+COMBIN(N)
  500 CONTINUE
      CURAV=CURAV/RNSTUD
      WRITE(6,41) ((NAME(L,N),L=1,6),HOLD(N),SCORES(N),COMBIN(N),
     1 N=1,NSTUDS)
      WRITE(6,22) RAWAV,AVMARK,CURAV
      WRITE(6,43)
      WRITE(6,42) (K,TAN(K),FAC(K),CORAV(K),K=1,NSTATS)
C**ANALYSIS OF EXAMINERS PERFORMANCE IN SETTING THIS T/F TEST **
      L=ZERO
      SCORE=ZERO
      DO 600 K=1,NSTATS
      SCORE=SCORE+FAC(K)
      IF(FAC(K).GT.ZERO) GO TO 600
```

```
      L=L+1
      NUM(L)=K
  600 CONTINUE
      SCORE=SCORE*HUND/RNSTAT
      WRITE(6,51) SCORE,(NUM(K),K=1,L)
      WRITE(6,23)
      STOP
 1000 WRITE(6,32)
      STOP
   12 FORMAT(3I6)
   15 FORMAT(27A1,6A6,F5.2,F4.1)
   21 FORMAT(1H1,9X,6A6 //10X,4HNAME,42X,6HSCORES /46X,7H    RAW ,
     1 9H WEIGHTED,8H CURRENT //)
   22 FORMAT(1H0,9X,7HAVERAGE,30X,3F7.2)
   23 FORMAT(1H1,8X,17HEND OF EXECUTION. )
   30 FORMAT(1H0,9X,31HPUNCHING ERROR IN DATA CARD OF  6A6)
   32 FORMAT(1H0,9X,61HPUNCHING ERROR IN CONTROL DATA CARD. EXECUTION IS
     1 TERMINATED.    )
   41 FORMAT(1H ,9X,6A6,3F7.1)
   42 FORMAT(1H ,9X,I2,L6,2F10.3)
   43 FORMAT(1H1,8X,31HSTAT.  T/F   FACTOR    CENTROID )
   51 FORMAT(1H0,9X,37HT/F EXAMINATION STATEMENTS ARE SCORED
     1 F6.1,19H  PERCENT OF IDEAL.  /
     2 1H0,9X,58HTHE FOLLOWING STATEMENTS DID NOT CONTRIBUTE TO THE SCOR
     3ING   /
     4 (1H0,9X,20I3))
      END
$IBFTC DECOMS  DECK
      SUBROUTINE DECODE(CODE,B,PUNCH)
      LOGICAL B,PUNCH
      DIMENSION CODE(27),B(81),CHAR(8)
      DATA (CHAR(K),K=1,8)/1H ,1H0,1H4,1H8,1HJ,1HY,1H-,1H(/
      DO 17 K=1,27
      IF(CODE(K).NE.CHAR(1)) GO TO 10
      B(K)=.FALSE.
      B(K+27)=.FALSE.
      B(K+54)=.FALSE.
      GO TO 17
   10 IF(CODE(K).NE.CHAR(2)) GO TO 11
      B(K)=.TRUE.
      B(K+27)=.FALSE.
      B(K+54)=.FALSE.
      GO TO 17
   11 IF(CODE(K).NE.CHAR(3)) GO TO 12
      B(K)=.FALSE.
      B(K+27)=.TRUE.
      B(K+54)=.FALSE.
      GO TO 17
   12 IF(CODE(K).NE.CHAR(4)) GO TO 13
      B(K)=.FALSE.
      B(K+27)=.FALSE.
      B(K+54)=.TRUE.
      GO TO 17
   13 IF(CODE(K).NE.CHAR(5)) GO TO 14
      B(K)=.TRUE.
      B(K+27)=.TRUE.
      B(K+54)=.FALSE.
      GO TO 17
   14 IF(CODE(K).NE.CHAR(6)) GO TO 15
      B(K)=.TRUE.
```

```
      B(K+27)=.FALSE.
      B(K+54)=.TRUE.
      GO TO 17
   15 IF(CODE(K).NE.CHAR(7)) GO TO 16
      B(K)=.FALSE.
      B(K+27)=.TRUE.
      B(K+54)=.TRUE.
      GO TO 17
   16 IF(CODE(K).NE.CHAR(8)) PUNCH=.FALSE.
      B(K)=.TRUE.
      B(K+27)=.TRUE.
      B(K+54)=.TRUE.
   17 CONTINUE
      RETURN
      END
$DATA
    81      27       1
Y4UU00(00Y-U UOU Y8Y8((YUY(GEOLOGY 116 TERM TEST 7 DEC 16 1965 7.0  65.0
( 44U4(0YY8U 40U0(80-U4YU -BELL,GREGORY  I  SOC+PHIL  VIC        47.8
YUU(0 -0(Y8U 40U Y Y-Y(YU0(BLAKE,F.M.  I  ENG.L.L.  UC           72.9
YU0-C04U0Y40 U0YUY8Y8(UYU (DAVEY,M.W.R.  I SOC+PHIL NC           60.1
Y4UU0U- 0Y84 U U-Y8Y-((YUY(DOBLE,RICHARD  I  SOC+PHIL  VIC       59.3
Y4UU0U( YY8U -U(0Y80-((YJ0-DUNLEVIE, LINDA  I  SOC+PHIL  UC      57.2
YU4U0Y-0((-U (U40Y8Y-((8U0(ELLIS,MISS P.J.  I  SOC+PHIL  VIC     53.5
YUUU00-0YY-U UUUUY8Y-(-YU0(FAYE,GORDON DAVID  I  SOC+PHIL  SMC 58.8
Y4040U-0YY-U4-0U08 Y-U(YUY GARGER.STEPHANIE ANNE I SOC+PHIL VIC51.8
(4 U00-0Y(8U 40U Y8Y-(4YUY(GRAHAM,DAVID  I  SOC+PHIL  VIC        61.4
YU0U04-00Y8U 40U0Y8Y-((YUYUHALLAM,C.B.  I  SOC+PHIL  NC          56.8
8 4U0 -0UY-U U0U Y8Y8U(YUYOHIBBINS,SUSAN  I  ML+L  UC            61.8
Y  0008 4Y84 U044-8Y8-Y04Y(HOPE,ELAINE I  SOC+PHIL  UC           48.4
Y40U00-0Y884 U0UUY8Y-((8UY(IRVINE,F.P.  I SOC+PHIL  VIC          58.1
Y4 00U-0YY-U U0U0Y8Y-(-YU0(KEE,S.F.  I  SOC+PHIL  VIC.           69.5
YUUU00-0-Y-U U0U0Y8Y8((YUY(KERNIGHAN, PAUL  I  SOC+PHIL  NC      67.9
Y4YU00(YUY-U U0U0Y4Y--YYUY(LOKESANSZKY,LORAND  I  SOC+PHIL  NC 46.1
Y4-U00(0(Y-U U0U0(8Y-(UYU0(MATHER,V.R.  I  SOC+PHIL  VIC         61.3
YUUU0U-0UY-U (0U0Y8Y-(4YU0UMATTLESS,D.R.  I  SOC+PHIL  NC        65.1
YUUU00(0YY8U U0U4Y8Y8((YU0(PIPHER, J. P.  I  SOC+PHIL  NC        60.1
Y 040 -04Y8U4U0448BY-(4Y40(PRICE, ALLAN  II  GEN ARTS  NC        61.3
804(U 80U8-(084U08-U8(UY 4YSOLOMON, M. M.  II POL SCI+ECON UC  32.1
Y4UUU0(8(Y-  U0UU88Y-U(YUY-STONE,DAVID B.  I  SOC+PHIL  VIC      56.4
Y  4U8 0U88U8 0U0Y  -0-YU84SZALAY, DARLENE  II  GEN.ARTS  VIC   39.8
YU0U0Y-00(8U -0UU0888(UYU0-VANDENBERK,DIDI  I  SOC+PHIL  VIC     59.5
YU8(0-(YYU8U (04UY 84Y-YU-YWAIN, M.  II  MOD. HIST.  VIC         44.9
YU0UU0-0(Y U (0(UY8Y-((YUY(WESTLAKE,SHARON LYNNE I SOC+PHIL NC 56.0
840U04-0(Y-U UUUUY Y8-(0UY(WYLIE,LYNDA MARION  I  SOC+PHIL  NC 68.4
```

```
$IP.JOB
$IBLDR MTF6                                                    12/16/65   MTF60000
$TEXT  MTF6                                                    12/16/65   MTF60001
*N P*X$77-7V*7 5 -07,   U7(P  07W*- 07(  0        0  -  - 7  W    -       MTF60002
*N9(---7V*7V*7 - 9Z(XY-----*,(-7PPZZ,*-7*3*7))X-((*(PP-(XP(PXPPP$X*((PWXPMTF60003
*N9(,(*7V*7V*7 (*P*XPZ0,*7*****6*--7PZZW*-(G*P***()PZ0,*=(*P(P*(X(P*P*X*PMTF60004
*N90((*7V*7V*7 **XZ0,*0(*P(P*(X(*)*)P*P*XX***(G(**))**PPPZX,*----7ZX,*,(MTF60005
*N7*(X*7V*7V*7 --3,XPZZW*=(**P*PP**)PP*)(XPPPZ0,*-(***))*)***))P*P*)PPPPMTF60006
*N-*(P*7V*7V*7 PPP*--=X***)*PX*)PPPPPPPPPPPPPPPPPPPPR0,*7((*))*)***))P*P)MTF60007
*N--$V*7V*7V*2+P*)(P**GPP*)(PPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP7-(,-7XP   MTF60008
*N-P(**P(*XX*X-74007X759 9- 7(7-+97(7-+97(7-+97X7-047(- 6.8+990480- 6690MTF60009
*N6P-**7X*X(*( 97(47(- 6.8+990480- 669097(    74007X75- 9- 7U   74+07(75-MTF60010
*N=PX**X(*7(*P-  - 7(    74+07(75-   9 7X7-+97(7-+97T7-0    74007X756 90 7XMTF60011
*N=--.-7(*X(*7-    74-07,75=  9 7X7--47(97(    74007(75=  -  - 7(77(57(57*MTF60012
*N=$((*7(*7(*P-47,97,-7((X(G7(-7((XXG7(G6957,-7,47(97(    74007(75- 9- 7UMTF60013
*N7(PX-7(*PX*X-    74+07X75-   - 7(77,7X(74 YXX77(G597-+95 (X((X(7-+97X7-+MTF60014
*N-((X*X(*7(*7-97G7-0    74007,75-   -  - 7(77(57(    74007X757 90 7(77,7X(MTF60015
*N-($)*7(*7X*7-74 YXX77(G5945 7-+(X((X(7--47,97(77,7X(74 XG(77(77(G59G5-MTF60016
*N-(((*7(*7(*7 57U75-57X75-57(75-57(57(47(=7(97(=7(95 57X47(67(97(47(95 MTF60017
*N5(X(*7(*7(*7-(X(07X77(77W77(E7(47,67(97,47(97*47(97((X(07(47,77(E7,47,MTF60018
*N-(W(*7(*7(*7-97,47T=7,97,-7((X,G7(G6947,67*97*(X(07,-7((X(G7(-7((X(G7(MTF60019
*N-M,(*7(*7(*7 -7((XXG7(-7((X(G7(-7((X(G7*-7((X(G7*-7((XXG7P-7((X(G7*G69MTF60020
*N-*,,*7(*7(*7-57,-7,47,97X47,97(47,97(47,97(G5947,97*47,97P(X(07XG5957,MTF60021
*N7)(**7(*7X*7--7,47*=7T37,77(47(67(97(47X67*97X77,7X(74 XG,77(G7947 67*MTF60022
*N--()*7(*7(*7-97*(X(07(57X47(67(97(47(67*97(77,7X(74 XG(77(G7947 67P97PMTF60023
*N-XX**7(*7(*7-(X(U7((X(U7X47X77(F7X47(77(F7(47(=7X97,47,97XG5947*67P77(MTF60024
*N-P((*7(*7(*7-F7(47*77(E7*47P77(E7P47P=7*97(47W77,77(97(47(87,37$77$47,MTF60025
*N7)G(*7(*7(*7-97(47(87(37*G7*47(97(47(97*47X67*97X(X*07(47,97,G5957,-7,MTF60026
*N-)((*7(*7(*7-47,97(77,7X(74 XG*77*G7977 77*67(97((XP07*77(77W77XF7(47,MTF60027
*N-XT**7(*7(*7-67(97,47(97*(X*07*47,77(F7,47T=7,97,G5947,67*97*(X*07*(X$MTF60028
*N--G$*7X*7(*7-(X(47,97(-7((X*G7PG6947*87,37*77*47,97*47*87W37PG7P47W97*MTF60029
*N7-))*7(*7(*7 74-74 -7X(XR-7P57*57P47(=7(-   77X67G67(77(E7G57P47(=7(-   MTF60030
*N-(X(*7(*7(*P-77X67G67*77(E7G47(67G97((XP07047(77(E7(    74007*757 90 7(MTF60031
*N-Z7(*7(*P(*7--7((X*G7NG6957,-7,77,7X(74 YXR77*G5945 7-+(XO(X*47(7-+47*MTF60032
*N-(X$*X(*P(*7-7-+47G7-+(XN07*7--    74007*75- 90 7(47,7-+47T7-+47(7-+7--MTF60033
*N4*(N-7(-7(*7-    74007*75- 90 7(7--    74007*75- 90 7(-7((X*G7PG6957(-7(MTF60034
*N-P((*7(*7X*7-47(7-+46-7-+47*7-+47(7-+(XP07*7--47,F8-) 6- 6E7X47,97(-7(MTF60035
*N-**-*7(*7(*7-(X$G7PG6957(-7(47(67*97(47*87,37*G7*57*47X17(97X77X(XP77*MTF60036
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*]-(7*X          7P                                                   MTF60041
$CDICT MTF6                                                    12/16/65   MTF60042
*N (((7XP 1-)*P7W ((( 7P(X*-6 (*(-6 (**-6 (*)-6 ***-6 (**-6 (*)-6 XD--  MTF60043
*N9((X(()-  (**-  XD--  (*)-  *7P-  *7P-  *7P-  *7P-  *,P-  *,P-  *,P-  MTF60044
*58X(-*XP-  *(P-  P*)-                                                 MTF60045
$DKEND MTF6                                                    12/16/65   MTF60046
$IBLDR DECOMS                                                          DEC00000
$TEXT  DECOMS                                                          DEC00001
*N G(-=7*=7V*2-0 70 70 -0 -0 -- 6- 90 -0 70 -PPP7PP7PPXPPPPXPPXPPXPP0 7DEC00002
*N9()**7V*7X*7-G6946 8 -3 -5 -56 56 56 5 746 9 -3 -5 -)6 56 56 5 746 8 -DEC00003
*N8-G.*7X*7(*7 3 -5 -56 )6 56 5 746 8 73 -5 -56 56 )6 5 746 8 -3 -5 -)6 DEC00004
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*N7X()*7V*XV*7-46 8 73 =5  )6 )6 )6 (XZ(G-5 R0  0 -76 74 - -G40549   7 -DEC00006
*N-*)P*7V*7(*7-740G 074-74876944976 (XZ76-76-76-76-76-76-76-76-44776 (XZDEC00007
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*N-(*)*X(*7(*X-0WZ76-0WZ76-(WZ76-0WZ76-0WZ76-(WZ76-0WZ76-0WZ76-(WZ7690WZDEC00009
*M6,X(*7(*6V-7 7690WZ769(WZ76=0WZ76=0WZ76*44-- 60 -        0 -    **)    DEC00010
$CDICT DECOMS                                                          DEC00011
*0 (X(8/  1-**)8/ ***   P*)-                                           DEC00012
$DKEND DECOMS                                                          DEC00013
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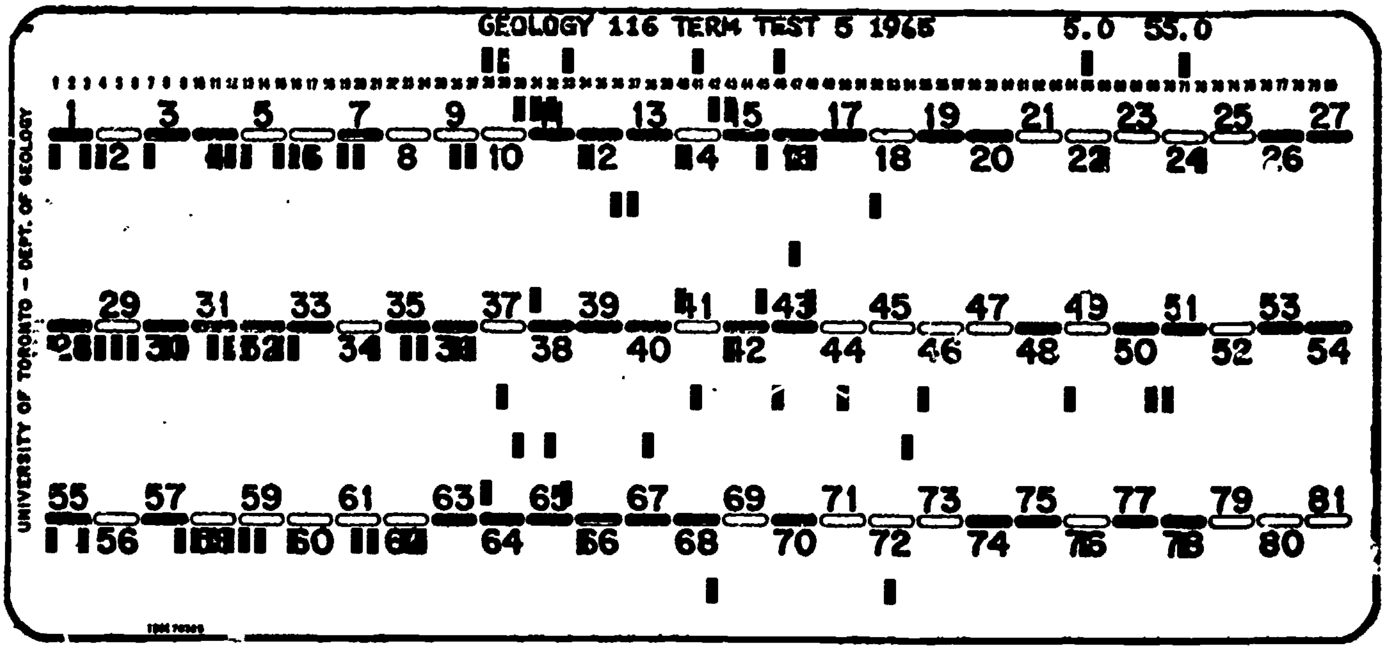
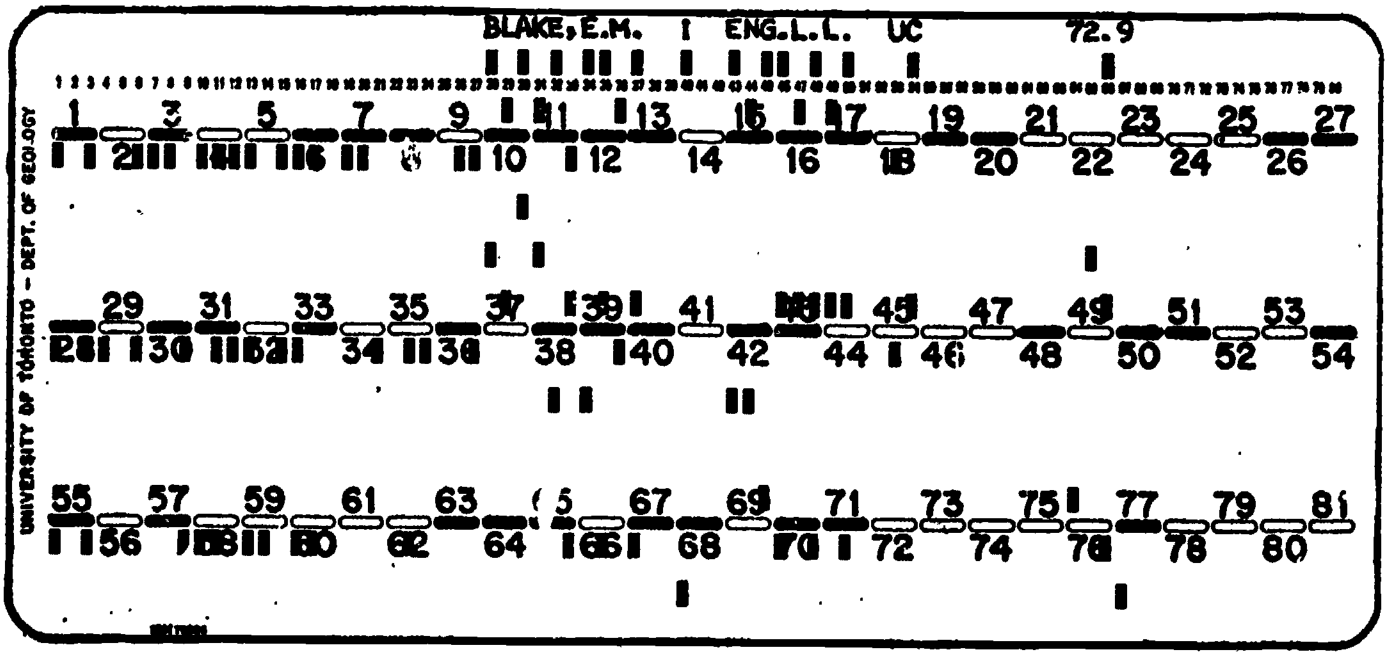
<u>Addenda</u>. A typical MS card, marked by the supervisor, punched, and ready for duplication, is shown below.



A typical MS card, marked by a student taking the test, punched, and ready for duplication, is shown below.



GEOLOGY 116 TERM TEST / DEC 16 1965

NAME	SCORES RAW	WEIGHTED	CURRENT
BELL,GREGORY I SOC+PHIL VIC	48.1	28.0	47.8
BLAKE,F.M. I ENG.L.L. UC	72.8	71.9	72.9
DAVEY,M.W.R. I SOC+PHIL NC	60.5	56.6	60.2
DOBLE,RICHARD I SOC+PHIL VIC	75.3	90.3	61.6
DUNLEVIE, LINDA I SOC+PHIL UC	67.9	72.6	58.7
ELLIS,MISS P.J. I SOC+PHIL VIC	70.4	77.1	55.9
FAYE,GORDON DAVID I SOC+PHIL SMC	75.3	86.9	61.2
GARGER,STEPHANIE ANNE I SOC+PHIL VIC	53.1	42.8	52.0
GRAHAM,DAVID I SOC+PHIL VIC	70.4	66.3	62.7
HALLAM,C.B. I SOC+PHIL NC	75.3	80.5	59.4
HIBBINS,SUSAN I ML+L UC	80.2	76.4	64.4
HOPE,ELAINE I SOC+PHIL UC	55.6	48.5	49.4
IRVINE,E.P. I SOC+PHIL VIC	72.8	81.8	60.2
KEE,S.E. I SOC+PHIL VIC.	72.8	80.0	70.0
KERNIGHAN, PAUL I SOC+PHIL NC	67.7	58.2	70.7
LOKESANSZKY,LORANT I SOC+PHIL NC	77.8	91.9	59.6
MATHER,V.R. I SOC+PHIL VIC	80.2	86.8	64.0
MATTLESS,R.R. I SOC+PHIL NC	75.3	84.0	66.6
PIPHER, J. P. I SOC+PHIL NC	65.2	90.3	63.7
PRICE, ALLAN II GEN ARTS NC	60.5	38.8	61.2
SOLOMON, M. M. II POL SCI+ECON UC	28.4	3.4	31.6
STONE,DAVID B. I SOC+PHIL VIC	70.4	78.9	60.1
SZALAY, DARLENE II GEN.ARTS VIC	35.8	0.0	39.2
VANDENBERK,DIDI I SOC+PHIL VIC	60.5	43.0	59.6
WAIN, M. II MOD. HIST. VIC	33.3	16.0	43.2
WESTLAKE,SHARON LYNNE I SOC+PHIL NC	70.4	78.4	58.1
WYLIE,LYNDA MARION I SOC+PHIL NC	72.8	83.4	69.0
AVERAGE	66.26	65.00	58.30

STAT.	T/F	FACTOR	CENTROID
1	T	0.000	0.778
2	F	0.000	0.111
3	T	1.000	0.259
4	T	1.000	0.630
5	T	0.000	1.000
6	T	1.000	0.333
7	T	0.219	-0.481
8	T	0.000	0.704
9	T	0.656	0.778
10	T	0.656	0.778
11	F	0.000	1.000
12	T	0.000	0.704
13	F	0.438	0.926
14	T	1.000	0.333
15	T	0.219	0.852
16	T	1.000	0.704
17	F	0.219	-0.481
18	T	1.000	0.630
19	F	0.000	1.000
20	T	1.000	0.778
21	F	0.000	1.000
22	T	0.000	0.778
23	T	0.875	0.407
24	T	0.000	0.852
25	T	1.000	0.778
26	T	1.000	0.630
27	T	1.000	0.556
28	F	0.219	0.852
29	T	1.000	0.556
30	T	1.000	-0.037
31	T	0.219	0.852
32	F	0.875	0.630
33	F	0.000	0.333
34	T	1.000	0.778
35	F	0.438	0.926
36	T	0.656	0.111
37	F	0.438	0.704
38	T	0.875	-0.037
39	T	0.219	0.852
40	F	0.875	0.852
41	T	0.875	0.852
42	F	0.219	0.852
43	T	0.438	0.926
44	F	0.656	0.111
45	F	0.656	0.778
46	F	0.219	0.852
47	F	0.438	0.926
48	F	0.000	-0.407
49	T	1.000	0.704
50	T	0.219	0.852
51	F	0.000	1.000
52	T	0.438	0.926
53	F	0.875	0.852
54	T	1.000	0.704
55	T	0.000	1.000
56	F	0.000	1.000
57	F	0.000	0.778
58	F	1.000	0.704
59	F	0.000	1.000
60	F	1.000	0.704

61	T	0.875	0.852
62	F	0.000	0.778
63	F	0.000	-0.185
64	T	0.438	0.926
65	T	0.219	0.852
66	F	0.438	0.926
67	F	0.438	0.926
68	F	0.875	0.407
69	F	0.000	1.000
70	F	0.000	0.778
71	F	0.000	0.926
72	T	0.438	0.926
73	T	0.656	0.556
74	T	1.000	0.704
75	T	0.438	0.926
76	T	0.875	0.630
77	T	1.000	0.407
78	T	0.219	0.852
79	F	0.000	1.000
80	T	0.438	0.037
81	T	0.219	0.630

THE EXAMINATION STATEMENTS ARE SCORED 47.8 PERCENT OF IDEAL.

THE FOLLOWING STATEMENTS DID NOT CONTRIBUTE TO THE SCORING

1 2 5 8 11 12 19 21 22 24 33 48 51 55 56 57 59 62 63 69

70 71 79

THE FOLLOWING STATEMENTS ARE TO BE JUDGED TRUE OR FALSE BUT NOT BOTH.

1 GLACIAL TILL IS COMPOSED OF UNSORTED CLASTICS.

2 A REASONABLE ESTIMATE OF THE WEIGHT OF SEDIMENT DISCHARGED INTO THE GULF OF MEXICO BY THE MISSISSIPPI RIVER YEARLY IS ONE MILLION TONS.

3 FLOOD PLAINS ARE NOT PRODUCED BY MEANDERING RIVERS THAT ARE ENTRENCHED.

4 IN AREAS THAT ARE DEEPLY WEATHERED, THE LAKE LEVELS ARE ALSO THE WATER TABLE LEVELS.

5 OXBOW LAKES OCCUR IN THE RIVER VALLEYS OF SOME MEANDERING RIVERS.

6 LACUSTRINE SEDIMENTS ARE SEDIMENTS THAT ARE DEPOSITED IN LAKES.

7 ALLUVIAL FANS ARE ANALOGOUS TO DELTAS BECAUSE BOTH HAVE DISTRIBUTIVE RIVER SYSTEMS.

8 IN HUMID CLIMATES, MATURE RIVER VALLEYS USUALLY ARE BOUNDED BY GENTLE SLOPES WITH VERY LITTLE IF ANY EXPOSED BEDROCK.

9 EXPOSED BEDROCK NEAR VALLEY FLOORS IN ARID CLIMATES BECOMES SMOOTHED, AND SOMETIMES POLISHED, BY WIND ACTION.

10 LIMESTONE IS MORE SOLUBLE THAN SHALE IN AVERAGE RIVER WATER.

11 CIRQUES ARE ROUND TOPPED HILLS THAT HAVE BEEN GLACIATED.

12 THE LOWER PART OF THE CRUST HAS THE PHYSICAL PROPERTIES OF BASALT OR GABBRO.

13 THE SEASONAL VARIATION OF WATER LEVEL IN AN UNUSED ARTESIAN WELL IS EXPECTED TO BE GREATER THAN THE VARIATION IN THE WATER TABLE THERE.

14 THERE ARE TWO HIGH TIDES AND TWO LOW TIDES IN THE SEA EVERY 24 HOURS APPROXIMATELY.

15 A BERGSCHRUND IS A KIND OF CREVICE NEAR THE HEAD OF SLOPING SNOWFIELDS.

16 IN ANY ONE AREA, THE WATER TABLE IS FURTHER BELOW THE SURFACE UNDER HILLS THAN UNDER VALLEYS.

17 THE EARTH ZONE OF LOW STRENGTH IN THE UPPER PART OF THE MANTLE IS CALLED THE MOHOROVICIC DISCONTINUITY.

18 MUDDY WATER HAS A GREATER DENSITY THAN CLEAR WATER, IF BOTH HAVE THE SAME SALINITY.

19 HANGING VALLEYS ARE FORMED MORE BY RIVER EROSION THAN BY ICE EROSION.

20 THE PERMEABILITY OF SOME LIMESTONE IS GREATER THAN THE PERMEABILITY OF AVERAGE SHALE.

21 EARTHQUAKE S WAVES AND P WAVES TRAVEL THROUGH EARTH MATERIALS WITH THE SAME VELOCITY.

22 WIND EROSION USUALLY IS A MORE RAPID PROCESS IN WARM ARID CLIMATES THAN IN WARM HUMID CLIMATES.

23 IT IS A REASONABLE POSTULATE THAT SOME NATURAL ROCK BRIDGES IN ARID REGIONS ARE FORMED BY WIND EROSION.

24 SEDIMENTARY BEDS CONSISTING OF DUST DEPOSITED FROM THE AIR ARE CORRECTLY CLASSIFIED AS LOESS.

25 GEYSERITE, A ROCK FORMED BY HOT SPRINGS, IS COMPOSED DOMINANTLY OF SILICA.

26 DENDRITIC AND ARBORESCENT ARE SYNONYMOUS ADJECTIVES INDICATING A KIND OF DRAINAGE PATTERN.

27 SURFACE WATER HAS A NET MOVEMENT IN THE SAME DIRECTION AS THE WIND, INDEPENDENT OF THE SIZE OF THE WAVES.

28 IF THE FRONT OF A VALLEY GLACIER IS RECEDING TO HIGHER LEVELS UP THE VALLEY, THEN THIS MEANS THAT THE FLOW OF ICE HAS STOPPED.
29 THE BASE LEVEL OF EROSION IN THE MISSISSIPPI VALLEY IS SEA LEVEL AT THE GULF OF MEXICO.
30 EARTHQUAKE P(PRESSURE) WAVES IN ROCKS ARE ANALOGOUS TO SOUND WAVES IN AIR.
31 OUTWASH PLAINS ARE EXPECTED TO CONTAIN BEDS OF SAND AND SILT .
32 ARTESIAN WELLS ARE THOSE THAT REQUIRE NO PUMPING TO BRING WATER TO THE SURFACE.
33 SOME METEORITES CONSIST PRINCIPALLY OF QUARTZ AND ORTHOCLASE.
34 AVERAGE RIVER WATER CONTAINS A DETECTABLE CONCENTRATION OF SOLUBLE CHLORIDES.
35 TIDAL CURRENTS AND TURBIDITY CURRENTS ARE SYNONYMOUS.
36 AVERAGE RIVER WATER TRANSPORTS TO THE SEA, IN TRUE SOLUTION, MORE CALCIUM CARBONATE THAN SODIUM CHLORIDE.
37 SEA WATER IN WAVE ACTION HAS A NET HORIZONTAL MOVEMENT IN A DIRECTION OPPOSITE TO THAT OF THE WIND CAUSING THE WAVES.
38 CLEAR RIVER WATER WILL FLOAT ON SEA WATER.
39 THE STEEPEST SLOPES OF MOVING BARCHAN DUNES ARE ON THE LEEWARD SIDES AND NOT ON THE WINDWARD SIDES .
40 METEORIC WATER IS THE NAME GIVEN TO WATER THAT IS GIVEN OFF DURING CRYSTALLIZATION OF IGNEOUS ROCKS.
41 IN PLAN VIEW, THE HORNS OF A MOVING BARCHAN DUNE POINT DOWN-WIND.
42 THE WATER TABLE IS THE LEVEL BELOW WHICH THE PORES AND JOINTS OF ROCKS ARE DRY.
43 DEPOSITS OF DRIFT ALONG THE SIDES OF GLACIATED VALLEYS ARE CORRECTLY CLASSIFIED AS LATERAL MORAINES .
44 WELL SORTED ACCUMULATIONS OF COBBLES AND SMALL BOULDERS ARE NOT EXPECTED TO OCCUR IN TERMINAL MORAINES .
45 RIP CURRENTS AND ALONGSHORE CURRENTS ARE ESSENTIALLY THE SAME KIND OF CURRENTS.
46 ESKERS ARE RIDGES OF SAND AND GRAVEL FORMED DURING THE ADVANCE,NOT THE RETREAT,OF A CONTINENTAL GLACIER .
47 SMALL ELONGATED BASINS ERODED BY CONTINENTAL GLACIERS ARE CORRECTLY CALLED DRUMLINS .
48 THE GRANITIC PART OF THE CRUST PROBABLY EXTENDS UNDER THE LARGE OCEANS AS WELL AS UNDER THE CONTINENTS.
49 DRUMLINS ARE MADE UP OF UNSORTED TILL WITH LITTLE OR NO BEDDING STRUCTURE .
50 SOME METEORITES CONSIST OF A METALLIC ALLOY, PRINCIPALLY OF IRON AND NICKEL.
51 PURE ICE SINKS IN CLEAR SEA WATER AT 0 DEGREES CENTIGRADE .
52 THERE ARE LONGITUDINAL AND TRANSVERSE TYPES OF DUNES AS WELL AS THE BARCHAN TYPE .
53 THE FOCUS OF AN EARTHQUAKE IS THE GEOGRAPHICAL POSITION OF THE CENTER OF DISTURBANCE PROJECTED TO THE OPPOSITE SIDE OF THE EARTH.
54 VALLEY GLACIERS OCCUR ON SOME OF THE ARCTIC ISLANDS OF CANADA .

55 STRONG WINDS BLOWING TOWARD A SHORE RAISE THE AVERAGE LEVEL OF THE WATER AT THE SHORE.
56 IF ALL OTHER VARIABLES ARE CONSTANT, THE EROSIONAL CAPACITY OF A RIVER IS NOT AFFECTED BY CHANGES OF ITS RATE OF FLOW.
57 VALLEY GLACIERS ERODE CHARACTERISTIC V-SHAPED VALLEYS IN BEDROCK.

58 VARVES ARE ICEBERGS GENERATED BY GLACIERS THAT FLOW INTO THE SEA OR INTO GLACIAL LAKES.
59 THERE ARE NO CONTINENTAL GLACIERS ON THE EARTH AT THE PRESENT TIME.

60 ALLUVIAL FAN AND TALUS ARE USED SYNONYMOUSLY.

61 THE AVERAGE RATE OF CONTINENTAL DENUDATION BY EROSION IS CLOSER TO ONE FOOT IN 5000 YEARS THAN TO ONE FOOT IN 5000000 YEARS.
62 THE AVERAGE DENSITY OF THE EARTH IS NEARLY THE SAME, BUT SLIGHTLY SMALLER THAN, THE AVERAGE DENSITY OF CRUSTAL ROCKS.
63 ROCK FLOUR OF RECENT GLACIAL ORIGIN CONSISTS MOSTLY OF CLAY.

64 THE DENSITY OF WATER IS LESS THAN THAT OF MOST ROCKS.

65 THE WINDWARD ANGLE OF SLOPE OF PARABOLIC DUNES IS LESS THAN THAT OF BARCHAN DUNES.
66 IF ALL OF THE EXISTING CONTINENTAL GLACIERS WERE MELTED, SEA LEVEL WOULD RISE LESS THAN 50 FEET.
67 SEDIMENTARY BEDS CONSISTING OF DUNE SAND ARE CORRECTLY CALLED LOESS.

68 IT IS EXPECTED THAT SEDIMENTARY BEDS IN ALLUVIAL FANS WOULD BE CONTINUOUS OVER GREATER DISTANCES THAN IN DELTAS.
69 A SEISMOGRAPH IS AN EARTHQUAKE STRONG ENOUGH TO BE DETECTED BY INSTRUMENTS.
70 METEORIC WATER AND METEORITIC WATER ARE SYNONYMOUS TERMS.

71 THE MOVEMENT OF GLACIERS IS PREDOMINANTLY DOWNHILL BUT LOCAL PARTS MOVING UPHILL ARE CALLED KARSTS.
72 ALL RIVERS TEND TO BECOME GRADED, GIVEN ENOUGH TIME.

73 THE CONCENTRATION OF SODIUM CHLORIDE IN SOLUTION IN THE MISSISSIPPI RIVER DECREASES WITH INCREASE OF DISTANCE FROM THE GULF OF MEXICO.
74 ENTRENCHED MEANDERS MAY BE ONE OF THE EFFECTS OF A LOWERING OF THE BASE LEVEL OF EROSION IN A REGION.
75 BARRIER BARS OR BEACHES OCCUR IN SOME PLACES ALONG THE EAST COAST OF NORTH AMERICA.
76 PIEDMONT GLACIERS ARE RELATED GENETICALLY TO VALLEY GLACIERS AND NOT TO CONTINENTAL GLACIERS.
77 THE ICE IN LARGE SNOWFIELDS SUCH AS CENTRAL GREENLAND WOULD BE EXPECTED TO HAVE A RECOGNIZABLE STRATIFICATION.
78 SALTS FORMED DURING CHEMICAL WEATHERING OF ROCKS OFTEN ARE REMOVED DURING WIND EROSION OF ARID REGIONS.
79 SOILS DEVELOPED ON RECENT LOESS DEPOSITS IN GENERAL ARE POOR FOR AGRICULTURE BECAUSE THEY LACK NUTRIENT SALTS.
80 A DELTA IS A SUBMARINE EQUIVALENT OF AN ALLUVIAL FAN.

81 ESTUARIES INDICATE A SHORELINE OF SUBMERGENCE.